



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/087,550 | 02/28/2002 | Robert D. Catiller | K35A0912 | 2162 |
| 26332 | 7590 | 08/05/2005 | EXAMINER | |
| WESTERN DIGITAL CORP. 20511 LAKE FOREST DRIVE C205 - INTELLECTUAL PROPERTY DEPARTMENT LAKE FOREST, CA 92630 | | | | GUILL, RUSSELL L |
| ART UNIT | | PAPER NUMBER | | |
| | | 2123 | | |

DATE MAILED: 08/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|--|------------------------------|--|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/087,550 | CATILLER, ROBERT D. | |
| | Examiner Russell L. Guill | Art Unit 2123 | |
| <i>-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --</i> | | | |
| Period for Reply | | | |
| A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION. | | | |
| <ul style="list-style-type: none"> - Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication. - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely. - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication. - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). <p>Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).</p> | | | |
| Status | | | |
| 1) <input checked="" type="checkbox"/> Responsive to communication(s) filed on <u>28 February 2002</u> . | | | |
| 2a) <input type="checkbox"/> This action is FINAL . | | 2b) <input checked="" type="checkbox"/> This action is non-final. | |
| 3) <input type="checkbox"/> Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under <i>Ex parte Quayle</i> , 1935 C.D. 11, 453 O.G. 213. | | | |
| Disposition of Claims | | | |
| 4) <input checked="" type="checkbox"/> Claim(s) <u>1-3</u> is/are pending in the application. | | | |
| 4a) Of the above claim(s) _____ is/are withdrawn from consideration. | | | |
| 5) <input type="checkbox"/> Claim(s) _____ is/are allowed. | | | |
| 6) <input checked="" type="checkbox"/> Claim(s) <u>1-3</u> is/are rejected. | | | |
| 7) <input type="checkbox"/> Claim(s) _____ is/are objected to. | | | |
| 8) <input type="checkbox"/> Claim(s) _____ are subject to restriction and/or election requirement. | | | |
| Application Papers | | | |
| 9) <input type="checkbox"/> The specification is objected to by the Examiner. | | | |
| 10) <input checked="" type="checkbox"/> The drawing(s) filed on <u>28 February 2002</u> is/are: a) <input checked="" type="checkbox"/> accepted or b) <input type="checkbox"/> objected to by the Examiner. | | | |
| Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). | | | |
| Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d). | | | |
| 11) <input type="checkbox"/> The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152. | | | |
| Priority under 35 U.S.C. § 119 | | | |
| 12) <input type="checkbox"/> Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f). | | | |
| a) <input type="checkbox"/> All b) <input type="checkbox"/> Some * c) <input type="checkbox"/> None of: | | | |
| 1. <input type="checkbox"/> Certified copies of the priority documents have been received. | | | |
| 2. <input type="checkbox"/> Certified copies of the priority documents have been received in Application No. _____. | | | |
| 3. <input type="checkbox"/> Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)). | | | |
| * See the attached detailed Office action for a list of the certified copies not received. | | | |
| Attachment(s) | | | |
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____. | |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) | |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>2/28/2002</u> . | | 6) <input type="checkbox"/> Other: _____. | |

DETAILED ACTION

1. Claims 1 - 3 have been examined. Claims 1 - 3 have been rejected.

Specification

2. The abstract of the disclosure is objected to because it exceeds 150 words. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1 - 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over IbmTechnicalDisclosure (IBM Technical Disclosure Bulletin NN880179, Diskette and Hardfile Electronic Drive Simulator, January 1988), in view of Moraru (U.S. Patent 5,404,492).

4.1. Regarding claim 1:

4.2. IbmTechnicalDisclosure teaches:

4.2.1. A hard disk drive simulator system, wherein the hard disk drive system comprises a read/write channel and a head actuator (Title; and page 1, lines 1 - 10; and page 1, lines 24 - 49).

4.2.2. Emulating reading and writing of data in the read/write channel based upon a model of the read/write channel (page 1, lines 45 - 49).

4.2.3. Providing a disk controller design base for defining integrated circuit elements comprising the disk controller circuit (page 1, lines 13 - 14; and page 1, lines 24 - 45).

4.2.4. Providing a controller environment to support execution and debug of firmware for operating the disk controller circuit (page 1, lines 1 - 3; and page 1, lines 24 - 45).

4.2.5. Performing a plurality of disk functions according to a script, wherein the plurality of disk functions comprise interaction of the read/write channel model, the disk controller design base and the controller environment (page 1, lines 24 - 49).

4.3. IbmTechnicalDisclosure does not specifically teach:

4.3.1. Emulating a behavior of the head actuator during track seek and track following operations based upon an electromechanical model of the head actuator.

4.3.2. Performing a plurality of disk functions according to a script, wherein the plurality of disk functions comprise interaction of the read/write channel model, the electromechanical model, the disk controller design base and the controller environment.

4.4. Moraru teaches:

4.4.1. Emulating a behavior of the head actuator during track seek and track following operations based upon an electromechanical model of the head actuator (column 1, lines 53 – 62).

4.4.2. Performing a plurality of disk functions according to a script, wherein the plurality of disk functions comprise interaction of the read/write channel model and the electromechanical model, (column 1, lines 35 – 68).

4.5. Regarding claim 2:

4.6. Moraru teaches:

4.6.1. That the plurality of disk functions are performed at a time-scaled rate, wherein the time-scaled rate maintains an accurate relative time relationship between the plurality of disk functions performed under the direction of the script, and a real-time performance of the disk functions (column 1, lines 45 – 68; and column 2, lines 1 – 10; and column 1, lines 35 - 40).

4.7. Regarding claim 3:

4.8. Moraru teaches:

4.8.1. Wherein the plurality of disk functions are performed at a plurality of environmental limits, wherein the models and the design base are made to operate according to their predicted behavior at the environmental limits (column 1, lines 35 – 41; and column 2, lines 40 - 45).

4.9. The motivation to combine the art of Moraru with the art of IbmTechnicalDisclosure would have been the benefits recited in Moraru that the Head-Disk Assembly simulator is fully programmable to mimic a targeted head disk assembly including the head positioner, mechanical characteristics, and movement of the read/write head across the tracks (column 1, lines 55 – 65). Further, the head disk assembly simulator provides a faster time-to-market by allowing development and debug of associated boards prior to availability of the drive mechanics (column 2, lines 20 – 27).

4.10. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Moraru with the art of IbmTechnicalDisclosure to produce the claimed inventions.

Conclusion

5. **Examiner's Note:** Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and

figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

6. The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure:
 - 6.1.1. Stefek (U.S. Patent Number 6,135,648; Hard Disk Rotational Latency Simulator)
 - 6.1.2. Bonola (U.S. Patent Number 5,953, 516; Method and apparatus for emulating a peripheral device to allow device driver development before availability of the peripheral device)
 - 6.1.3. Challa (U.S. Patent Number 5,291,584; Methods and apparatus for hard disk emulation)
 - 6.1.4. Cha, E.; Bogy, D.B.; "Numerical simulation and animation of Head-Disk-Assembly dynamics", November 1991, IEEE Transactions on Magnetics, Volume 27, Issue 6, Part 2
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell L. Guill whose telephone number is 571-272-7955. The examiner can normally be reached on Monday – Friday 9:00 AM – 5:30 PM.
8. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on 571-272-3749. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Any inquiry of a general nature or relating to the status of this application should be directed to the TC2100 Group Receptionist: 571-272-2100.
9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RG

Russ Guill
Examiner
Art Unit 2123


Paul L. Rodriguez 8/3/05
Primary Examiner
Art Unit 2125